

REMARKS

In the present Office Action, claims 33-113 were examined. Claims 33-37, 52-62, 91-97, 112 and 113 are rejected, claims 38-51, 63-90 and 98-111 are objected to, and no claims are allowed.

By this Amendment, claims 34, 55, 56 and 94 have been amended, no claims have been canceled, and no claims have been added. Accordingly, claims 33 to 113 are presented for further examination. No new matter has been added. By this Amendment, claims 33-113 are believed to be in condition for allowance.

Explanation of Above Amendments

The above amendments to claims 34, 55, 56 and 94 are made as requested by the Examiner. The amendments to claims 34, 55 and 94 merely delete duplicate limitations and correct antecedent basis. The amendment to claim 56 merely corrects the antecedent basis of a limitation. Specifically, “the first filtering capacitor (81)” in claim 56, line 2, should be changed to “a first filtering capacitor (81)”. No new matter or change of scope of any claims is intended or believed to be included by these claim amendments.

Rejections/Objections under 35 USC §112

The Examiner rejected claims 34, 55, 56 and 94 under 35 U.S.C. §112, first paragraph. Applicant respectfully traverses this rejection by the amendments to those claims.

Rejections under 35 USC §102

The Examiner rejected claims 33-37 and 93-97 under 35 U.S.C. §102(b) as being anticipated by Maehara et al. (U.S. Patent No. 6,075,715). In making this anticipation rejection, the Examiner stated the following:

“Regarding claims 33-35, 93-95, Maehara et al. (Fig. 30) disclose an electrical circuit comprising: a power source (1); a load (C3, La, T1); a switching bridge (Q1, Q2); a bridge capacitor (C1), diodes (D1, D2), wherein the connections between these elements are inherently disclosed. Regarding claims 36, 37, 96, 97, wherein switches are bipolar transistors.”

Applicant respectfully traverses this rejection for the following reasons.

There are huge differences in the principle of the operation between circuits described in Maehara et al. and the boost bridge amplifier of claims 33-37 and the boost bridge amplifier of claims 93-97. For example, one resonant circuit of Maehara et al. is formed from the load circuitry (3) reflected to primary of the transformer T1, primary of the transformer T1 and the second capacitor C2 of small value, through switch Q2 and diode D2, or through the first capacitor C1, switch Q1 and diode D1. (See claim 1 of the reference.)

Another resonant circuit of Maehara et al. is formed from the load circuitry (3), the inductance circuit and the second capacitor C2 of small value, through switch Q2 and diode D2, or through the first capacitor C1, switch Q1 and diode D1. (See claim 2.)

Furthermore, Fig. 7 and Fig. 8 of Maehara et al. disclose timing diagrams with extremely variable capacitor C2 voltage VC2, due to the operation in resonance.

In contrast, Figs. 11, 14, 17 and 20 of the present specifications and appropriate claims 33, 34, 35, 93, 94 and 95 of the present invention are directed to circuit of load 5 comprising resistance and smoothing inductance connected in series.

In addition, the power supply 1 of the present invention is a DC power supply with constant voltage which is contrary to extremely variable capacitor C2 voltage VC2, used in Maehara et al.

Therefore, it is quite clear that the operation of claimed boost bridge amplifier of the present invention is free from any resonances utilized in Maehara et al. It should be noted that the ordinary skilled artisan in this field of power electronics would clearly recognize the differences between resonant (as illustrated by Maehara et al.) and non-resonant converters (such as the present invention). This demarcation is shown in the following book: Ned Mohan, Tore M. Undeland, William P. Robbins; "Power Electronics: Converters, Applications and Design"; 3rd Edition, John Wiley and Sons, October 2002. Note that this book has separate chapters directed to these two different types of converters (see Chapters 8 and 9).

Stated another way, independent claims 33 and 93 of the present application utilize less number of elements to operate than Maehara et al. Furthermore, neither one of circuits disclosed in Maehara et al. will operate with DC power source (1) alone, since all of them require an additional element: the capacitor C2 of small value. Therefore, claims

33-37, 93-97 are not anticipated by Maehara et al., and are patentable together with claims 112 and 113 are patentable.

Rejections under 35 USC §103

The Examiner rejected claim 52-62, 91, 92 and 113 under 35 U.S.C. §103(a) as being obvious and unpatentable in view of Maehara et al. In making this obviousness rejection, the Examiner stated the following:

“Regarding claims 52, 53, 91, 92, 112, 113, Maehara et al. disclose the claimed invention except the specific load as claimed. However, such as load would have been considered a matter of design choice in the absence of unexpected results if not an intended use of the invention, wherein Maehara et al. disclose a specific load as discharge lamp. Regarding claims 54-56, 58, 59, Maehara et al. disclose the claimed invention an output filter having the connection thereof. Maehara et al. (Fig. 30) disclose a electrical circuit comprising: a power source (1); a load (C3, La, T1); a switching bridge (Q1, Q2); a bridge capacitor (C1); a filtering capacitor (C4); diodes (D1, D2), wherein the connections between these elements are inherently disclosed. However, it is known in the art that addition of a known type filter will only enhance circuit operation, such as filtering out noise or improving output signal. As such, adding a filter to a circuit would have been considered a matter of design choice/engineering. Regarding claims 57, 60-62, wherein switches are bipolar transistors.”

Applicant respectfully traverses this rejection for the following reasons.

First, the arguments made in response to previous rejection are also applicable here.

Present claims 52, 91 and 113 are limited to a dual voice coil loudspeaker as load (5). This type of load provides special effects on the power supply (1) current and generated average force, disclosed in the description (see page 11, lines 1 to 17 of underlying PCT Appl. WO01/01554). Since these effects cannot be provided by Maehara et al., claims 52, 91 and 112 should not be rejected as being obvious over its teachings for this reason alone.

Present claims 53, 92 and 113 also are limited to three-phase electric motor as load (5). This type of load provides special effects on power supply (1) current and generated average force, disclosed in the description (see page 12, lines 17 to 31, and page 13, lines 1 to 3 of WO01/01554). Since these effects cannot be provided by Maehara et al., claims 53, 92 and 113 should not be rejected as being obvious.

Present claims 36, 37, 57, 60, 61, 62, 96 and 97 circuits described in claims 35, 34, 56, 59, 58, 55, 95 and 94, are further limited utilization of semiconductor switches as active switches. Since claims 36, 37, 57, 60, 61, 62, 96 and 97 are dependent upon, respectively, and those dependent claims incorporate those unobvious features that should not be rejected.

In the first paragraph of the present Office Action, the Examiner commented that Applicant had previously argued that “load (5) is directly coupled with the power supply (1) allowing DC current through load (5) for supplying switching bridge (3)”, but argued that claims 33, 54 and 93 are so limited. The Examiner's comments have been considered, but it is believed that the claim language in these claims “the first node of said power supply (1) is connected to the first node of each phase of said load (5)” is proper. While the language in the specification referring to Fig. 2 talks about directly connecting the load (5) to the power supply (1), there are other embodiments that talk about the inclusion of other structures (e.g. an input filter) between the power supply and the load.

Applicant is pleased to see that claims 38-51, 63-90 and 98-111 are allowable. At the present time, for cost considerations, Applicant will not make claims 38, 63 and 98 into independent claims at this time.

Please note equivalents to this U.S. Patent Application include European Patent EP 1196982 B1 as well as German Patent DE 6---5519D and Japanese Patent Application 2001-506669.

Accordingly, Applicant submits that the cites referenced, does not anticipate or make obvious the invention as presently claimed and that the application is now in condition for allowance. Therefore, Applicant respectfully requests reconsideration and further examination of the application and the Examiner is respectfully requested to take such proper actions so that a patent will issue herefrom as soon as possible.

If the Examiner has any questions or believes that a discussion with Applicant's attorney would expedite prosecution, the Examiner is invited and encouraged to contact the undersigned at the telephone number below.

Please apply any credits or charge any deficiencies to our Deposit Account No. 23-1665.

Respectfully submitted,
M. Prokin et al.

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A handwritten signature in black ink, appearing to read "William A. Simons", written over a horizontal line.

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